

CLAIMS

What is claimed is:

1. An imageable element comprising, in order:
a substrate having a hydrophilic surface,
5 an underlayer comprising a first polymeric material over the hydrophilic surface, and
a top layer comprising a second polymeric material over the underlayer,
in which:

- 10 the second polymeric material is crosslinked;
the top layer is ink receptive and insoluble in an alkaline developer;
the top layer and the underlayer are each removable by the alkaline developer following thermal exposure of the element; and
the element comprises a photothermal conversion material.

- 15 2. The element of claim 1 in which the first polymeric material comprises about 25 to about 75 mol% of N-phenylmaleimide; about 10 to about 50 mol% of methacrylamide; and about 5 to about 30 mol% of methacrylic acid.

3. The element of claim 1 in which the second polymeric material comprises a crosslinked self-crosslinking material.

- 20 4. The element of claim 3 in which the crosslinked self-crosslinking material is a crosslinked self-crosslinking acrylic emulsion or a crosslinked self-crosslinking urethane/acrylic emulsion.

5. The element of claim 1 in which the second polymeric material comprises a crosslinked melamine resin.

- 25 6. The element of claim 1 in which the second polymeric material comprises a crosslinked carboxylic acid containing polymer and a crosslinked compound that comprises epoxide or arizidine functionality.

7. The element of claim 1 in which the second polymeric material comprises a crosslinked naphthoquinone diazide or a crosslinked mixture of a

novolac resin and a resole resin.

8. The element of claim 1 in which the top layer is substantially free of the photothermal conversion material.

5 9. The element of claim 8 in which the second polymeric material comprises a crosslinked self-crosslinking material.

10. The element of claim 9 in which the crosslinked self-crosslinking material is a crosslinked self-crosslinking acrylic emulsion or a crosslinked self-crosslinking urethane/acrylic emulsion.

10 11. The element of claim 8 in which the second polymeric material comprises a crosslinked melamine resin.

12. The element of claim 8 in which the second polymeric material comprises a crosslinked carboxylic acid containing polymer and a crosslinked compound that comprises epoxide or arizidine functionality.

15 13. The element of claim 8 in which the second polymeric material comprises a crosslinked naphthoquinone diazide or a crosslinked mixture of a novolac resin and a resole resin.

14. The element of claim 8 additionally comprising an absorber layer between the underlayer and the top layer, in which the absorber layer comprises the photothermal conversion material.

20 15. The element of claim 8 in which the underlayer comprises the photothermal conversion material.

16. A method for forming an imageable element, the imageable element comprising, in order:

25 a substrate having a hydrophilic surface,
an underlayer comprising a first polymeric material over the hydrophilic surface, and
a top layer comprising a second polymeric material over the underlayer, in which:

the second polymeric material is crosslinked;
 the top layer is ink receptive and insoluble in an alkaline developer;
 the top layer and the underlayer are each removable by the alkaline developer following thermal exposure of the element; and

5 the element comprises a photothermal conversion material;
 the method comprising the steps of:

- (a) forming the underlayer over the hydrophilic surface of the substrate;
- (b) applying a coating solution comprising a coating solvent and a crosslinkable material over the underlayer; and
- 10 (c) crosslinking the crosslinkable material to form the second polymeric material.

17. The method of claim 16 in which the crosslinkable material is crosslinked by heating.

15 18. The method of claim 16 in which the crosslinkable material is crosslinked by irradiation with ultraviolet radiation.

19. The method of claim 16 in which the crosslinkable material comprises a self-crosslinking material.

20. The method of claim 16 in which the coating solvent comprises water.

20 21. The method of claim 20 in which the crosslinkable material comprises a self-crosslinking acrylic emulsion or a self-crosslinking urethane/acrylic emulsion.

22. The method of claim 20 in which the crosslinkable material comprises a melamine resin.

25 23. The method of claim 20 in which the crosslinkable material comprises a carboxylic acid containing polymer and a compound that comprises epoxide or arizidine functionality.

24. The method of claim 20 in which the crosslinkable material is crosslinked by heating.

25. The method of claim 16 in which the coating solvent is an organic solvent or a mixture of organic solvents.

5 26. The method of claim 25 in which the crosslinkable material is crosslinked by heating.

27. The method of claim 25 in which the crosslinkable material is crosslinked by irradiation with ultraviolet radiation.

10 28. The method of claim 25 in which the crosslinkable material comprises a carboxylic acid containing polymer and a compound that comprises epoxide or arizidine functionality.

29. The method of claim 25 in which the crosslinkable material comprises a naphthoquinone diazide or a mixture of a novolac resin and a resole resin.

15 30. A method for forming an image, the method comprising the steps of:

thermally imaging an imageable element and forming an exposed imageable element comprising exposed and unexposed regions; and
developing the exposed imageable element with an alkaline developer
20 and removing the exposed regions;

in which the imageable element comprises, in order:

a substrate having a hydrophilic surface,

an underlayer comprising a first polymeric material over the hydrophilic surface, and

25 a top layer comprising a second polymeric material over the underlayer, in which:

the second polymeric material is crosslinked;

the top layer is ink receptive and insoluble in an alkaline developer;

the top layer and the underlayer are each removable by the alkaline developer following thermal exposure of the element; and
the element comprises a photothermal conversion material.

31. The method of claim 30 in which the imaging step is carried out
5 with infrared radiation.